



UTAH DEPARTMENT of
ENVIRONMENTAL QUALITY

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WORK PLAN: WATER QUALITY PRIORITY PROJECTS GKM FRE 408

Project Title: Utah Lake Numeric Nutrient Criteria Development

Political Subdivision: Utah County

Clean Water Act Program: Water Quality Standards, Assessment, Total Maximum Daily Loads

Amount Requested: \$1,600,000

Granting Vehicle: 106

Project Goal: The goal of the Utah Lake Water Quality Study (ULWQS) is to develop:

- Nitrogen and phosphorous numeric criteria that are protective of the lake's recreational, aquatic and agricultural beneficial uses
- A plan to achieve the criteria through regulatory and incentive based approaches across the watershed

The study approach consists of three phases to achieve this goal:

- Phase 1 – Data gathering and characterization
- Phase 2 – Development of in-lake criteria for nitrogen and phosphorus
- Phase 3 – Implementation planning for Phase 2 criteria

The ULWQS Phase 1 was completed in December, 2018. The tasks outlined below are part of Phase 2 and 3 activities.

Project Process: The ULWQS is led by a 16-member Steering Committee representing diverse stakeholder interests and an independent Science Panel responsible for developing and recommending nutrient criteria for consideration by the Steering Committee. The final recommendation will be made to the Division of Water Quality, the Water Quality Board and ultimately to EPA for approval.

References: Utah Lake Water Quality Study



TASKS	ACTIVITIES & MILESTONES	Proposed Budget
1. Strategic Monitoring and Study Plan Implementation Date: Present – December, 2025	<p>The ULWQS Science Panel developed a strategic study plan that identifies information and knowledge gaps to fully answer the <u>Initial Charge Questions</u> and to implement the Numeric Nutrient Criteria Framework (NNC) approach. The strategic study plan was developed by: 1) inventorying evaluating existing literature, Utah Lake data, and mechanistic modeling tools available to the ULWQS; 2) determining gaps in that information, and 3) determining the approach for filling the identified information gaps. The activities in this task will acquire information to fill the identified gaps, analyze the information acquired in context of the strategic study plan and NNC Framework, and reporting of results.</p> <p>a. Monitoring and Field Investigations. This activity will implement the recommendations of the strategic study plan. Activities include assessing and quantifying the importance of sediment chemistry on the lake nutrient cycle, the influence of carp and macrophytes on sediment phosphorus mobility, effect of wind on turbidity and lake chemistry, and assessment of trophic interactions that influence the nutrient cycle.</p> <p>b. Analysis and Interpretation of Results. Data and information acquired through the Monitoring and Field Investigation activity will be assessed and analyzed to: 1) ensure the information met study objectives; 2) answer the relevant Initial Charge Question; 3) inform the ULWQS NNC Framework; and 4) determine the amount of certainty associated with each.</p> <p>c. Initial Charge and NNC Framework Reporting A technical report will be developed for Steering Committee and Science Panel review and approval. The report will detail data and information available to answering each of the Initial Charge Questions, provide answers where possible, and outline next steps for any unanswered questions.</p>	\$600,000



TASKS	ACTIVITIES & MILESTONES	Proposed Budget
<p>2. Model Development and Implementation</p> <p>Date: Present – December, 2025</p>	<p>d. In-lake model development and implementation WASP and EFDC in-lake models are currently being developed and calibrated by the University of Utah under an EPA STAR grant to assess impacts of climate change on lake water quality. The lake models are not fully equipped for the specific purpose of developing NNC and answering the Initial Charge Questions and several significant modifications are needed. This task will provide resources to enhance the models to meet the needs of the Science Panel and Steering Committee, implement the NNC framework, and help inform Phase 3 load reduction scenarios. In addition to the WASP and EFDC models the Science Panel is exploring the potential use of several other modeling techniques to provide supplemental information. This task will: 1) enhance existing WASP and EFDC models; 2) develop supporting models as requested by the Science Panel as necessary; and 3) evaluate responses to in-lake nutrient dynamics in response to a variety of watershed loading scenarios.</p> <p>e. Watershed model development and implementation Phase 3 of the ULWQS (Implementation Planning) will evaluate potential scenarios and strategies for meeting the in-lake NNC developed in Phase 2. Watershed models, such as HSPF and SWAT will be necessary to simulate the complex dynamics in the Utah Lake watershed such as water diversions, agricultural and other nonpoint sources, stream processing of nutrients, and many others. This task will: 1) complete a watershed model selection exercise; 2) develop the selected watershed model; and 3) evaluate watershed reduction scenarios as identified by the Steering Committee and Science Panel.</p> <ol style="list-style-type: none"> 1. The model selection exercise will compile a comprehensive list of applicable models, conduct a detailed analysis to assess model capabilities for simulating characteristics of the Utah Lake watershed, develop a recommendation for the selected model for Steering Committee 	<p>\$500,000</p>



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	<p>and Science Panel approval. This task will also include presentations to the Steering Committee and Science Panel and modifications to the report as necessary. The final product will be a model selection technical report with a recommendation and approach for developing the selected model or suite of models.</p> <ol style="list-style-type: none">2. This task will also develop the model recommended in the model selection report. The model will be developed in consultation with the Steering Committee and Science Panel to ensure watershed conditions are characterized appropriately. This task includes model construction, calibration, and validation.3. Once the model is fully developed, calibrated, and validated, the model will be applied to identify watershed sources of nitrogen and phosphorus, assess a series of watershed reduction scenarios to determine ability to meet in-lake NNC criteria, and to determine associated cost with each to inform the Steering Committee implementation planning activities. The watershed model may also be used to assess viability of pollution trading to achieve the most cost effective solutions to reduce nutrient pollution to the lake, to develop TMDLs in the future, or to prioritize nonpoint source implementation activities.	
<p>4. Numeric Criteria Development</p> <p>Date: Present – December, 2025</p>	<p>The results of the strategic study plan and model development tasks will directly inform the NNC Framework and will ultimately be used to derive NNC for Utah Lake. This task will incorporate all data and information acquired through these tasks and already available to the study, provide for the technical analysis to develop in-lake NNC for nitrogen and phosphorus, and develop the necessary supporting materials.</p>	<p>\$300,000</p>



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5. Steering Committee and Science Panel Workshops Date: Present – December, 2025	<p>The ULWQS Steering Committee and Science Panel play an integral role in the study process. These committees work very closely to exchange information and ideas necessary to answer the Initial Charge Questions, developing the NNC Framework, implementing ongoing field investigations, among others. Technical support is provided to the Science Panel by Tetrattech Inc. and facilitation of the Steering Committee and Science Panel workshops is provided by RESOLVE and SWCA. Each year the Steering Committee and Science Panel hold the following events:</p> <ul style="list-style-type: none">• 2 – ½ day Steering Committee workshops• 2 – ½ day conference call workshops• 4 – 2 day Science Panel workshops• 4 – 2 hour Science Panel conference call workshops	\$200,000



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Project Title: Agricultural Water Quality Improvements

Political Subdivision: Statewide

Clean Water Act Program: Nonpoint Source Reduction

Amount Requested: \$1,000,000

Granting Vehicle: 319

Project Goal: To incentivize agricultural producers to adopt practices that improve water quality and add value to their operations by:

- Increasing the voluntary adoption of nutrient management plans
- Increasing the investment and effectiveness of agricultural infrastructure that protects water quality.

References/Attachments:

TASKS	ACTIVITIES & MILESTONES	PROJECTED COST
Incentive Based Payments to Agriculture Producers for Nutrient Management Plans	<ul style="list-style-type: none">• Develop, Certify and Implement Nutrient Management Plans• Administer Incentive payments (\$12/acre for implementation of NMPs)	\$750,000
Administer Agricultural Infrastructure Grant Funds	<ul style="list-style-type: none">• If identified in a NMP, approve project plans for infrastructure improvements that qualify for 319 grant funds.• Administer Infrastructure grants	\$916,667



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WORK PLAN: WATER QUALITY PRIORITY PROJECTS GKM FRE 408

Project Title: Septic Density Studies

Political Subdivision: Wasatch County, Utah County, Bear Lake, Garfield County, Washington County

Clean Water Act Program: Watershed protection, Nonpoint source, On-site wastewater permitting

Amount Requested: \$400,000

Granting Vehicle: 106

Project Goal: The goal of developing septic density studies is to evaluate the local hydrogeologic conditions and water quality to determine risk to groundwater resources and recommend allowable septic densities to protect drinking water quality. There is a need to evaluate appropriate septic densities in sensitive source protection areas or lake shorelines that are affected by development and threatened by increased nitrogen or E. coli loading. Increasingly, DWQ is aware of water quality impacts to Utah's ground water and surface waters due to proliferation of septic systems in unsewered developments. DWQ is seeking site-specific evaluations of watersheds with high density of septic systems to better understand hydrological and geological factors associated with pollutant transport and flows in impacted areas to support decisions implemented by our partners in local health departments around the state. These studies will guide appropriate permitting and will assist local entities with developing ordinances to protect drinking water resources. Budget request is to support up to 50% of the cost of septic density studies through a competitive grant process. Match will come from local health departments and/or state of Utah. A recent bid for a county wide septic density studies was \$400,000, so it is estimated that DWQ will be able to fund at least 2 septic density studies through this grant.

Project Process: The Division of Water Quality will issue a notice of a competitive grant and evaluate applicants on their critical need for septic density evaluations, ability to meet match requirements and demonstrated applicability to protect drinking water sources.



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TASKS	ACTIVITIES & MILESTONES	PROJECTED COST
Administer Septic Density Grant Funds	<ul style="list-style-type: none">• Issue competitive grant process for septic density studies• Evaluate applicants and administer funding for ~2 studies	<p>\$400,000</p> <ul style="list-style-type: none">• 2 grants for septic density studies ~\$200,000 each• Matching funds (50%)